33 00 00 • SITE UTILITIES

SECTION INCLUDES

Site Domestic Water
Site Fire Water Service
Water Well
Site Sanitary Sewer
Site Storm Sewer
Foundation Drainage

RELATED SECTIONS

03 30 00	Concrete
22 00 00	Plumbing
26 00 00	Electrical
31 00 00	Earthwork
32 00 00	Site Irrigation
32 10 00	Paving
33 56 16	Underground Storage Tanks

REFERENCES

Standard Specifications for Highways and Bridges, Commonwealth of Massachusetts, Current Edition

WATER SERVICE

MATERIALS

Check with the local water department for specific requirements and any special conditions. Generally, water pipe shall be Ductile Iron, manufactured in accordance with the requirements of ANSI/AWWA C 153/A21.153 and shall be special thickness Class 52 with a minimal wall thickness of 0.31 inches for 6-inch, 0.33 inches for 8-inch, 0.35 inches for 10-inch and 0.37 for 12-inch diameter pipe.

Special thickness Class 53 shall be used for all pipe larger than 16-inches diameter.

Pipes will have cement mortar lining twice the normal thickness and seal coating in accordance with ANS A21.11/AWWA C111, latest version and will be push-on joint, provided with sufficient quantities of accessories, and of standard 18 or 20 foot lengths.

All fittings will be ASTM A-536 ductile iron, cement lined mechanical joint and will meet or exceed the requirements of AWWA C-110, with fittings 4inches to 24 inches pressure rated at 350 psi and 30 inch to 48 inch at 250 psi working pressure. All accessories (glands, gaskets, T-bolts, and nuts) shall be in accordance with AWWA C-111. All mechanical bolts (T-bolts) shall be Cor-Ten or equal.

Curb stops, corporations, valves and appurtenances will conform to the requirements of the local water department and be compatible with their stock.

WATER SERVICE, CONT.

DESIGN

Test the town water supply for mineral content and pressure and design the system accordingly. Check with the local water department to see if the town has test data available. Perform a fire flow test, especially in areas where there is low pressure or as required by the local authorities.

Describe the Contractor's scope of work with regard to installation and coordination of all utilities, including those of outside parties, i.e., cable, telephone, gas, electric, etc.. Coordinate this information for the appropriate trades in the mechanical sections of the specifications. Clarify whether the Contractor or city or town or outside party will supply labor and materials.

Utility back charges and permit and connection fees should be paid by the LHA.

Check with local fire AHJ for fire suppression requirements that may exceed code requirements so that they can be considered during design.

Test pipelines (in sections) for strength and for leakage at 150 psi for one hour minimum in accordance with standard testing protocols. At the successful completion of testing, send the results to the local authority and, if necessary, DEP and the line will be chlorinated in accordance with the local authority's requirements.

SEWER/SEPTIC

MATERIALS

Sewer (septic) pipe and fittings (gravity) will be polyvinyl chloride (PVC) conforming to ASTM D 3034 for 4 inch through 15 inch diameter and ASTM F679 for 18 through 27 inch diameters all with SDR 35. Fittings will be rubber ring conforming to ASTM D 3212.

Sewer and septic force main shall be PVC conforming to ASTM D1784 D2241 and commercial standard PS22-70, latest revisions. Pipe shall be class 150 (DR 18) and joints shall be elastomeric ring, bell and spigot type meeting ASTM D3139-77 or latest revision.

Gravity lines for septic leaching trenches shall be PVC schedule 40 NSF.

Pressure distribution lines will be PVC 160 psi pipe SDR 26, with rubber rings and conform to ASTM F477.

PVC non-pressure pipes shall be furnished in standard lengths.

PVC gravity sewer tees, wyes, and tee wyes to be used for service connections shall be PVC SDR 35 fittings with ring tite joints.

Push-on joints shall consist of

- a single continuous, molded rubber ring gasket;
- a bell socket cast integrally with the pipe or fitting; and
- a pipe or fitting plain end. Push-on joints shall have the same pressure rating as the pipe or fitting of which they are a part.

Gaskets for push-on joints shall be vulcanized natural or synthetic rubber and be free of porous areas, foreign materials and visible defects.

SEWER LINES

DESIGN

Gravity pipes shall be designed using standard sanitary engineering procedures in order that continuous "positive" flow is always present between all manholes. Flow will be established from the highest point to the lowest point on the sewer line. Maintain minimum design slope of 0.005 and a minimum scouring velocity of 2.0 feet/second (fps) at all times.

Take borings along the pipe line at intervals no greater than 300 feet and provide the information on the plans or in the specifications including depth to groundwater and any ledge, boulders or other physical obstructions noted. In any event it is the Designer's job to design the project according to the investigative information.

Profile plans should include manhole number, stationing, invert(s) in, invert(s) out, slope and type of pipe material. Layout plans should include any and all topography, structures, other utilities, as well as all previously mentioned information and any other information needed to design and construct the project.

SEPTIC SYSTEMS

Design septic systems in accordance with both 310 CMR 15.000 Title V and the regulations of the local Board of Health, whichever governs.

For the purpose of design, the following daily flows will be used:

- elderly (Ch 667) developments – ***150 gallons/day per bedroom***;
- family (Ch 200 & 705) developments – ***110 gpd/bedroom***;
- special needs (Ch 167 & 689) -***175 gpd/bedroom***.

In some cases, it may be necessary to submit the design to one of the DEP Regional Offices because of superseding regulations. In those instances, the DEP rules and/or regulations shall govern.

Soil evaluation and percolation testing shall be conducted by a Massachusetts DEP Certified Soil Evaluator and witnessed by the local Board of Health's representative. Incorporate information from these tests into the plans and specifications as part of the bidding documents.

For septic pump stations, the pump station shall be a package pump station from a single manufacturer. Verify the power requirements and availability prior to completing the bid documents for the project.

A certified, stamped, as-built plan of the new system, will be required to be submitted to the local Board of Health, Local Housing Authority and DHCD.

STORM DRAINS

MATERIALS

Conform to the description, materials and construction methods of the requirements of appropriate sections of the latest edition with current amendments of the Standard Specifications for Highways and Bridges, Department of Public Works, Commonwealth of Massachusetts.

Use the following guidelines and refer to local DPW and utility official's requirements for drain pipe sizes and materials:

- 12 inch diameter (minimum) reinforced concrete for paved areas (designed to meet the load of traffic)
- 8 inch diameter schedule 40 PVC for landscaped areas

Acceptable materials for manholes and catch basins include precast concrete and concrete block.

All frames, grates and covers should be traffic-bearing H-20 rated cast iron, 24-inch inside diameter as manufactured by E.L. LeBaron Co., or approved equal. Covers should be labeled "DRAIN".

Where possible and feasible, install “Cascade” style grates, especially on sloped, paved areas. In all other locations, use common engineering practice.

Avoid grates:

- with long narrow slots that could be a hazard for bicycle and wheelchair wheels, and
- that are smaller than 12” because they are easily removed by vandals - creating a hazard.

Trench drains may have either concrete or fiberglass boxes; fiberglass is less expensive.

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DESIGN

The storm drainage system should be designed in accordance with the latest hydrological engineering techniques and incorporate all "Best Management Practices" as outlined by The Massachusetts Department of Environmental Protection, current edition. Stormwater design should be calculated using the 25 year design storm with characteristics for the region in which the system will be located. A copy of the calculations, including water shed analysis map(s), will be submitted to DHCD as part of the design review process.

Consult with the local officials as to when and where it may be necessary to submit plans for their review and approval especially where the Conservation Commission and/or Planning Board may have to get involved.

Consult the local Conservation Commission and Department of Public Works for requirements for gas traps for catch basins at roads, driveways, and parking lots.

Avoid locating manholes, catch basins, curb valves, or other obstructions in pedestrian pathways, especially in the middle of curb cuts.

PIPELINE CONSTRUCTION

EXECUTION

All pipes shall be laid to the lines and grades shown on the drawings or as directed by the engineer. Verification of lines and grades will be done prior to any further work commencing and any variations noted and addressed.

All pipes to be laid in open trench excavation shall be bedded and uniformly supported over their full length on foundations of the types specified and shown on the drawings.

Flat bottomed trenches shall be excavated and dewatered prior to preparing the specified foundation.

After the trench has been brought to the proper grade, the pipe shall be laid carefully in the trench using ropes, slings and proper equipment to accomplish the task.

Pipes will be laid true to the grades shown on the drawings, its interior and ends thoroughly cleaned of any debris and/or soil and when the engineer has been satisfied, backfilled and compacted in accordance with the contact documents.

FOUNDATION DRAINAGE

MATERIALS

Acceptable pipe materials include perforated schedule 40 PVC and slotted polyethylene tubing.

Provide a soil separator filter fabric equal to Geomat 65 by Ford Manufacturing or Mirafi 140N.

DESIGN

Pipes should be minimum of 4 inches in diameter; consider 6 inch diameter pipe for areas prone to vermin infestation.

EXECUTION

Line trenches with drainage fill and filter fabric.

Wrap the filter fabric all the way around the gravel, not just around the pipe.